



**Verification and certification report form for  
CDM programme of activities  
(Version 03.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the programme of activities (PoA)</b>	5342: African Improved Cooking Stoves Programme of Activities	
<b>Version number(s) of the PoA-DD(s) to which this report applies</b>	4.3	
<b>Version number of the verification and certification report</b>	3.1	
<b>Completion date of the verification and certification report</b>	23/11/2020	
<b>Monitoring period number and duration of this monitoring period</b>	Seventh Monitoring Period 01/07/2019 – 31/03/2020 (Both days inclusive)	
<b>Number and version number of the monitoring report to which this report applies</b>	Monitoring Report Number: 1.0 Monitoring Report Version: 4.1	
<b>Coordinating/managing entity (CME)</b>	Envirofit International Ltd.	
<b>Host Parties</b>	<b>Host Parties of the PoA</b>	<b>Is this a host Party to a CPA covered in this report? (yes/no)</b>
	Ghana	Yes
	Nigeria	No
	Liberia	No
<b>Applied methodologies and standardized baselines</b>	AMS-II.G. ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass Standardized baseline: NA	
<b>Mandatory sectoral scopes</b>	Sectoral scope: 3: Energy demand	
<b>Conditional sectoral scopes, if applicable</b>	NA	
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report</b>	105,219 tCO <sub>2</sub> e	
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report</b>	20,186 tCO <sub>2</sub> e	
<b>Name and UNFCCC reference number of the DOE</b>	E0066: Earthood Services Private Limited	

Name, position, and signature of the  
approver of the verification and certification  
report



Dr. Kaviraj Singh  
Managing Director

## SECTION A. Executive summary

The aim of the PoA is the distribution of improved biomass cookstove in Ghana, Nigeria, and Liberia. Thus, PoA through the distribution of improved stoves aims at reducing the GHG emissions by replacing the less efficient non-renewable biomass based cookstove with a more efficient one.

In the absence of the PoA non-renewable biomass (wood and charcoal) is used as fuel in the traditional three stone cookstoves. The distributed stove has better efficiency; thus, it provides the same amount of energy with less fuel consumption and releases less GHG emission.

This verification covers stove distribution in Ghana under three CPAs i.e., 5342-P1-0013-CP1, 5342-P1-0014-CP1 and 5342-P1-0015-CP1.

The verification team confirms that the total emission reductions achieved under this monitoring period 01/07/2019 – 31/03/2020 (both days inclusive) are 20,186 tCO<sub>2</sub>e

### **Scope of verification:**

The verification is an independent and objective review, of ex-post determination of the monitored reductions in GHG emissions, by the DOE. The verification includes the assessment of implementation and operation of the PoA as set out in the revised accepted PoA-DD & CPA-DDs viz., 5342-P1-0013-CP1, 5342-P1-0014-CP1, 5342-P1-0015-CP1 in the monitoring period.

The verification tests the data and assertions set out in the monitoring report for this monitoring period by the CMEs and is based on the following:

- (i) The approved methodology AMS-II.G. ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass/6/ applied in the PoA-DD/1/ & CPA-DDs/2,3,4/
- (ii) The registered and revised accepted PoA-DD & CPA-DDs and monitoring plan/1,2,3,4/
- (iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
- (iv) The CDM Validation and Verification Standard (VVS) for PoA version 2.0/9/
- (v) The CDM Project Standard (PS) for PoA /7/ and Project Cycle Procedure (PCP) for PoA version 2.0 /8/
- (vi) Relevant decisions, guidance, and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity's reported emission reductions

The verification has considered both quantitative and qualitative aspects on stated/reported emission reductions. The monitoring report (all versions) and corresponding supporting documentation were assessed in accordance with the rules defined by UNFCCC, as appropriate and applicable to the PoA. The verification is not meant to provide any consulting or recommendations to the CME/others. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

### **Verification Process:**

The verification process is conducted as per internal CDM Quality Manual, which includes the following steps;

- a) Contract with CME and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
- b) Completeness check of Monitoring Report
- c) Publication of Monitoring Report at UNFCCC website
- d) Desk review (refer Section D.1 of this report) of Monitoring Report and corresponding ER sheet by verification team and planning of Remote Audit Survey (including sampling approach (refer Section D.4 of this report) to be applied)
- e) During Remote Audit Survey (refer Section D.2 of this report) (interview with relevant stakeholders) by verification team consistent of Team Leader and all Technical Experts, as a minimum
- f) Follow up activities e.g., interviews (refer Section D.3 of this report)

- g) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section D.5 of this report)
- h) Independent technical review (refer Section F of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and corresponding supporting evidences)
- i) Reporting and closure of TR comments/findings (refer Section D.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section G and H of this report).
- j) Issuance of final verification report to contracted CME (or authorized representatives) and submission of request for issuance to UNFCCC, as appropriate.

### Verification Conclusion:

Based on the outcome of the verification process of the registered/revised accepted PoA “African Improved Cooking Stoves Programme of Activities” and its 3 CPAs (**5342-P1-0013-CP1**, **5342-P1-0014-CP1**, **5342-P1-0015-CP1**) for the monitoring period **01/07/2019 – 31/03/2020** (including both dates) it is confirmed that the implementation of referenced registered/revised accepted PoA and CPAs are complying with applicable CDM rules and regulations. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodologies AMS-II.G. ver 3.0: Energy efficiency measures in thermal applications of non-renewable biomass and the monitoring plan contained in the registered/revised accepted PoA-DD.

Earthood Services Private Limited can certify that the emission reductions from the registered CDM PoA UN#5342 “African Improved Cooking Stoves Programme of Activities” in Ghana during the period **01/07/2019 – 31/03/2020** (including both days) amount to **20,186 tCO<sub>2</sub>e**. Therefore, this is being submitted for a request for issuance, as per UNFCCC procedures.

## SECTION B. Verification team, technical reviewer and approver

### B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection*	Interview(s)	Verification findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
2.	Verifier	IR	Vatsa	Vaishali	Central Office	Y	N	Y	Y
3.	Technical Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
4.	Methodology Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
5.	Local Expert	IR	Wealth	Moses Dada	Central Office	Y	N	Y	Y

\*Remote Audit Survey was conducted

### B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Gautam	Ashok	Central Office
2.	TA to TR	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

## SECTION C. Application of materiality in conducting the verification

### C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Observational error by monitoring survey staff of CME/CPA implementer while recording the responses of users in relation to survey parameters	High	The survey is conducted for representative samples of population, which may impact the population significantly. Surveyors may be unsupervised at the site.	Verification team randomly selected the samples from CME surveyed HHs. The recorded survey forms by CME were checked with DOE remote survey observations. The verification team interviewed the monitoring staff and checked their training records.
2.	Calculation Errors	Med	The process in manual and therefore there is potential risk of errors / omissions/misstatements.	All calculations were checked by verification team with respect to applicable requirements under various documents viz., methodology, PoA DD/1/, CPA DDs/2,3,4/ etc.

### C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PoAs, Version 02.0/9/ the prescribed thresholds for materiality for CDM PoAs are as under;

Type of PoA	PoAs comprising large-scale CPAs			PoAs comprising only small-scale CPAs	PoAs comprising only micro-scale CPAs
Emission Reductions (tCO <sub>2</sub> e)/year	500,000 or more	300,001 to 499,999	300,000 or less		
Materiality Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 5% as PoA comprises only small-scale CPAs.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO <sub>2</sub> e) in this monitoring period	27,373	20,186*
Applicable Threshold (%) as per CDM VVS for PoAs Version 02.0	5.0%	5.0%

\*The decrease in the ER's of the final monitoring report/13/ is due to typographical errors identified in the ER sheet which have been considered at the time of verification.

Monitored Parameter (Symbol / Description )	Reporting Frequency	Number of Discrete Data (Total)  Total (100%)	Sample selected for verification Sample (%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
CPA-5342-P1-0013-CP1, 5342-P1-0014-CP1, 5342-P1-0015-CP1						
For ICS:						
$\eta_{new,y}$ (Efficiency of the device being	Annually	27	27(100% data was checked)	None	NA	NA

deployed as part of the project activity in year y)						
<b>N<sub>all</sub></b> (Total number of stoves installed)	Annually	5342-P1-0013-CP1: 4,094 5342-P1-0014-CP1: 4,079 5342-P1-0015-CP1:3,591	ICS database/5/ was checked for the information And 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
<b>SOF</b> (Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling)	Annually	127 (80 samples for SOFcharcoal;; 47 samples for SOF woodfuel)	Usage and Monitoring survey/11/ results were checked and 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
<b>f<sub>old</sub></b> (Fraction of end users that are still using baseline stoves)	Annually	123 (77 samples for f <sub>old</sub> charcoal; 46 samples for f <sub>old</sub> woodfuel)	Usage and Monitoring survey/11/ results were checked, and 22 ICS were checked during the Remote Audit Survey/10/	None	NA	NA
<b>μ<sub>old</sub></b> (The amount of woody biomass consumption that is consumed through the continued use of old stoves)	Annually	16 (8 per fuel type)	Usage and Monitoring survey/11/ results were checked, and 16 ICS (100% of data) were checked during the Remote Audit Survey/10/	None	NA	NA
<b>Stove<sub>year</sub></b> Calculated	Annually	5342-P1-0013-CP1: 4,094	ER calculation	None	NA	NA

average stove operation years in the monitoring period. If stoves have been operating for 365 days then $\text{Stove}_{\text{year}} = 1.0$ . If less than 365 days, then $\text{Stove}_{\text{year}}$ is represented as a fraction of 365 (eg. 180 days = 0.5).		5342-P1-0014-CP1: 4,079 5342-P1-0015-CP1: 3,591	sheet/12/ was checked. (100% data checked)			
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Based on the above table, it can be confirmed that the actual individual and aggregated material error is determined for the registered PoA as per CDM VVS for PoA/9/. The applicable threshold for materiality in accordance with CDM PoA VVS Version 2 para 308(d)/9/ is 5%.

## SECTION D. Means of verification

### D.1. Desk/document review

A desk review was conducted by the verification team that included:

- A review of data and information provided for its completeness.
- A review of registered monitoring plan, monitoring methodologies including applicable tools, standards, and the applicable applied standardized baselines.

All the documents reviewed during the verification process are listed in the Appendix 3 of Verification Report.

### D.2. On-site inspection<sup>1</sup>

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	Interview of the monitoring personnel and CME representative	-	22/06/2020-23/06/2020	Deepika Mahala and Vaishali Vatsa
2.	Interview of the head of the institution related to the DoE sampled project devices	-	22/06/2020-23/06/2020	Deepika Mahala and Vaishali Vatsa

No physical on-site inspection was conducted for this verification. However, alternative means of site visit were adopted by the assessment team as explained in following sections of this report.

#### Mandatory Site-visit

In-line to para 322 of VVS for PoA Version 2.0/9/, site-visit for the current verification was not mandatory as these 3 CPAs (5432-P1-0013-CP1 to 5432-P1-0015-CP1) have already been verified by ESPL previously via a physical on-site visit on 25/09/2019-27/09/2019 under their first verification and none of these CPAs have achieved more than 300,000 tCO<sub>2e</sub> since the last visit.

<sup>1</sup> This table lists down the activities conducted during the remote audit survey

**Planned Site-Visit**

Nevertheless, an on-site visit was initially planned from 15/06/2020. However, with the COVID-19 outbreak and increased exposure risk due to international travel and nation-wide lockdown imposed in India (DOE office country), by the Government of India, the on-site visit was not possible as per original plan. An advisory issued by the Indian Ministry of Health & Family Welfare on 30/05/2020 said that "There will be phase-wise reopening of the country and the International air travel has been listed under phase III and the dates for re-starting shall be decided later to the assessment of the situation"/44/.

Due to COVID-19 outbreak, the situation in the country has not become stable yet and the lockdown has been extended by the government in contaminated zones. As the situation of pandemic sprawl is not improving in the country by each passing day and the date to which the site visit can be postponed was uncertain. Thus, alternate means were chosen by the verification team instead of conducting on-site visit.

**Issue with the postponement of Site-visit:**

The on-site audit assessment for this verification could not be postponed as the cases of coronavirus were rising with an extremely high number of death rates in many countries/43/. The Indian government has banned international flights since March and the ban has still not been lifted/49/. By each passing day it was not clear when the travel ban would get lifted. Delaying the site visit would have led to delayed issuance of the CERs. The CME relies upon the CER revenue generated from the project for the working capital of the project. It was clarified by the CME that along with the impact on the generation of the working capital of the project, the delay in the project will also lead to the delay in meeting the project CER retirement time-line and eventually leading to the cancellation of the CERs issued from the project (as set under Appendix 1 of the ERPA/41/):

Projected Retirement Volume	Deadline
250,515 CERs	01/12/2020

**Exemption by CDM EB**

Due to the outbreak of COVID-19, CDM-EB has exempted site visits for all projects until 31/12/2020. An internal checklist with details of PoA/CPA and checklist for alternative means for site-visit exemption was submitted to the Technical Manager for approval in accordance with the ESPL CDM QMS.

**Alternative means applied**

Following alternative means have been used to verify the project details:

1. Remote Audit Surveys including interviews of CME/CPA Implementer, end users and the personnel's involved in monitoring and preparation of the monitoring report and related documents via remote survey. Random samples for eleven ICS users per sampling frame (i.e. Total 22 samples) (details on sampling provided in section D.3) were drawn from the CME's monitoring sample survey sheet and interviewed through skype calls.
2. Photographic evidences of the ICSs /39/, Installed ICSs with Unique Serial IDs/40/, Monitoring Survey (filled) Forms/24/.
3. Monitoring personnel training manual/20/
4. WBT evidences (WBT summary sheet/12/, WBT efficiency calculator/45/, WBT replacement sheet/46/, WBT stove test pictures/33/, WBT Training evidences/36/, WBT Equipment pictures/34/, WBT filled forms /35/)
5. Review of the other Documentary evidences (ER sheet/12/ Sample Size Calculation sheet, Monitoring Survey Data Sheet)

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Lohia	Rohit	Envirofit International	22/06/2020-23/06/2020 (Via Skype)	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
2.	Olaore	Biodun	Envirofit (Director West	22/06/2020-23/06/2020	CPA Implementation	Deepika Mahala, Vaishali Vatsa



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			Africa)	(Via Skype)		and Moses Dada Wealth
3.	Osae-Nyarko	Emmanuel	Envirofit (Ghana)	22/06/2020-23/06/2020 (Via Skype)	Monitoring Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
4.	Cudjoe Ahiekpor	Julius	Kumasi Technical University	23/06/2020 (Via Skype)	Monitoring Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
5.	Aklike	Comfort	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
6.	Dashie	Apedo	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
7.	Agbedoe	Gladys	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
8.	Akuako	Stephen	ICS User (Econofire)	22/06/2020	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
9.	Deku	Soba	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
10.	Ahordo	Wotsise	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
11.	Kpogo	Godsway	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
12.	Asravor	Agnes	ICS User (Econofire)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
13.	Toroko	Rebecca	ICS User (CH2200)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
14.	Dzaka	Gadys	ICS User (CH2200)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
15.	Adzra	Georgina	ICS User (CH2200)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
16.	Kemeh	Jennifer	ICS User (CH2200)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
17.	Agor	Dzifa	ICS User (CH2200)	22/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth

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18.	Koranteng	Magaret	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
19.	Agyarko	Mabel	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
20.	Yirenkyi	Seline	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
21.	Anani	Faustina	ICS User (Econofire)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
22.	Agboada	Lucia	ICS User (Econofire)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
23.	Gad	Victoria	ICS User (Econofire)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
24.	Forson	Nana Baah	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
25.	Tetteh	Julliet	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth
26.	Saah	Gloria	ICS User (Econochar)	23/06/2020 (Via Skype)	DOE Field Survey	Deepika Mahala, Vaishali Vatsa and Moses Dada Wealth

### D.4. Sampling approach

#### CME's Sampling approach

For the purpose of sampling, CME has followed the Standards for Sampling and Surveys for CDM project activities and programme of activities /15/ which is in-line with the PoA DD/1/. The CME has applied Simple Random Sampling at PoA level for different monitoring parameters as per validated PoA DD /1/and registered CPA DDs/2-4/. 95/10 confidence precision was applied by CME in the sampling which is appropriate as per the single sampling covering 3 CPAs. Thus, CPA-wide single sampling plan was used by the CME.

#### DOE's Sampling Approach

In order to meet the requirements of paragraph 30 and 31 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8/15/ the verification team applied acceptance sampling in the verification (in accordance with para 28). The verification team selected a random sample of CME's sampled records to check the acceptability (or otherwise) of the data for each such record with CME's sample records and determine if the CME's sample records meet the requirements.

The current verification is for the CPAs 5342-P1-0013-CP1, 5342-P1-0014-CP1, 5342-P1-0015-CP1.

The verification team has selected the sample size as 11 HHs of each type- charcoal and wood, for the purpose of the remote survey to check the acceptability of CME's sampling results or otherwise. In total, 22 samples were checked by the DOE verification team.

Sample Size: (Per Sampling Frame)

CPA Ref No.	AQL	UQL	Producer Risk	Consumer	Sample Size;	Acceptance
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				Risk	Min	No.
5342-P1-0013-CP1, 5342-P1-0014-CP1, 5342-P1-0015-CP1	0.5%	20%	10%	10%	11	0

The verification team selected the random samples of CME's sampled records to check the acceptability (or otherwise) of the data for each such record with CME's sample records, and determine if the CME's sample records meet the requirements. All the households reported that they have only one stove, they confirmed their UIDs and the operational status. All the stoves were reported to be in working condition. No discrepant records were observed by the verification team.

#### D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
<b>General</b>	-	-	-
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
<b>Programme of activities</b>	-	-	-
Compliance of the programme implementation with the registered PoA-DD	CL#01	CAR#03	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents <sup>2</sup>	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
<b>Component project activities</b>	-	-	-
Compliance of the CPA implementation with the included CPA design document	-	-	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied	-	-	-

<sup>2</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

methodologies and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	CL#02 CL#03	CAR#02	-
• Implementation of sampling plan	CL#02	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	CAR#02	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	CAR#01	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>03</b>	<b>03</b>	<b>00</b>

## SECTION E. Verification findings

### E.1. General

#### E.1.1. Compliance of the monitoring report with the monitoring report form

<b>Means of verification</b>	The monitoring report form used is CDM-PoA-MR-FORM version 03.0/17/ which is an appropriate form and the latest version available at the time of verification/submission for the request for issuance. All the sections of the aforesaid form were duly filled as per the guidelines and provided all the relevant details.
<b>Findings</b>	No finding was raised.
<b>Conclusion</b>	The final monitoring report /13/ is found to be in-line with the latest CDM-PoA-MR-form/17/ available and the instructions therein.

#### E.1.2. Remaining forward action requests from validation and/or previous verifications

There is no FAR from the previous verification/32/.

#### E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
African Improved Cooking Stoves Programme of Activities CPA 00001 (Ghana) Version: 3.2 Ref: 5342-P1-0001-CP1	No	06/12/2012	Version 4.3 dated 07/06/2014	NA

African Improved Cooking Stoves Programme of Activities CPA 00002 (Ghana) Version: 3.0 Ref: 5342-P1-0002-CP1	No	21/10/2013	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00003 (Ghana) Version: 2.0 Ref: 5342-P1-0003-CP1	No	08/11/2013	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00004 (Nigeria) Version: 6.1 Ref: 5342-P1-0004-CP1	No	23/09/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00005 (Nigeria) Version: 6.1 Ref: 5342-P1-0005-CP1	No	23/09/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00006 (Liberia) Version: 2.0 Ref: 5342-P1-0006-CP1	No	31/12/2014	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00010 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0007-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00011 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0008-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00012 (Nigeria) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0009-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00013 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0010-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA

African Improved Cooking Stoves Programme of Activities CPA 00014 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0011-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00015 (Liberia) supported by Republic of Korea Version: 4.0 Ref: 5342-P1-0012-CP1	No	05/04/2019	Version 4.3 dated 07/06/2014	NA
African Improved Cooking Stoves Programme of Activities CPA 00007 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0013-CP1	Yes	12/04/2019	Version 4.3 dated 07/06/2014	Yes <sup>3</sup>
African Improved Cooking Stoves Programme of Activities CPA 00008 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0014-CP1	Yes	12/04/2019	Version 4.3 dated 07/06/2014	Yes <sup>4</sup>
African Improved Cooking Stoves Programme of Activities CPA 00009 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0015-CP1	Yes	12/04/2019	Version 4.3 dated 07/06/2014	Yes <sup>4</sup>

## E.2. Programme of activities

### E.2.1. Compliance of the programme implementation with the registered programme design document

<b>Means of verification</b>	<p>The PoA through the distribution of efficient improved cookstoves in Ghana aims at reducing GHG emissions by replacing less efficient non-renewable biomass based cookstove. This monitoring period includes the implementation and monitoring of 3 CPAs from 5342-P1-0013-CP1, 5342-P1-0014-CP1 &amp; 5342-P1-0015-CP1 in Ghana. The coordinating and managing entity (CME) is Envirofit International Ltd. and CERPD Co., Ltd. is the CPA implementer/18/. CERPD has fully sponsored the ICS to beneficiary households in the CPAs, as well covered the cost of operation and management of the CPAs. Their roles and responsibilities are defined in the signed agreement.</p> <p>In the absence of the project activity, the ends users would have cooked on traditional three stone stove and used non-renewable biomass as fuel leading to release of high amount of GHG emissions in the baseline.</p> <p>CPAs of this PoA covered in the verification report involve dissemination of following types of ICS:</p>
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<sup>3</sup> [https://cdm.unfccc.int/PoAIssuance/iss\\_db/poaiss44258902/view](https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss44258902/view)

1. Econofire /SmartSaver Wood (Wood Fuel)
2. Econochar / SmartSaver Charcoal, CH2200, CH5200 and CH5300 (Charcoal)

Stove Specifications:/19/

Parameter description	Econofire /SmartSaver Wood	Econochar /SmartSaver Charcoal	CH2200	CH5300	CH5200
Thermal Efficiency	30.2 %	34.3 %	38.2%	35.7%	36.1%
Unit Size	25.5 x 40 x 35.5 cm (height x width x depth)	28 x 37 x 42 cm (height x width x depth)	15.4 x 31.3 x 22.9 cm (height x width x depth)	36.6x31.5x26 cm (height x width x depth)	16.2x37.5x31 cm (height x width x depth)
Unit Weight	2.7 kg	3.7 kg	2.3 kg	5.0 kg	3.5 kg
CO emissions % improvement	77%	70%	50%	50%	50%

All the models are portable and have a grate. The details of the ICS models installed were verified from the manufacturer's specification/19/ provided by the CME. Model CH2200 were not found mentioned in the registered CPA DDs. However, footnote 7 of the CPA-DDs/2-4/ states that the CME can add other models in the CPA subsequently, provided they meet the methodological / eligibility requirement for inclusion of CPA in the PoA. The compliance of CH2200 with relevant methodological / eligibility requirement for inclusion of CPA in the PoA was assessed and found ok by the verification team. Thus, the dissemination of new model was found to be in line with the CPA DDs/2-4/.

For CH5200 and CH5300 stove units distributed in the current monitoring period the distribution was extremely low (less than 5% of total population) and the CME has not included it in ER calculations conservatively. A temporary deviation has been reported accordingly. Please refer the PRC validation report/51/.

During the Remote Audit Survey, the installations of the ICS claimed by the CME were checked and found to be in-line with the technical description provided in the Monitoring report/13/.

Also, the verification team checked the implementation status of the project activity and found it to be as defined in the registered PoA-DD/1/, and MR/13/.

Interview of the personnel involved in the QA/QC procedures revealed that the procedures mentioned in the PoA-DD/1/ were being followed and the training records/20/ regarding the trained personnel were checked.

During the desk review, the stated address of the 22 samples (selected for RSV) in the CPA-distribution database/5/ were verified while interviewing the end-user and further it was cross-checked using the latlong website/48/ to confirm whether the samples of the implemented CPAs lie within the boundary of the PoA and found to be in-line with the registered PoA-DD/1/ and MR/13/.

Further, based on the review of ICS end user database (presented in ER sheet)/5/, physical observations and interview conducted during the site visit, the verification team found that:

- The CPA(s) were implemented within the boundary of the PoA as described in the revised accepted PoA-DD/1/.
- The CME is same as that mentioned in the revised accepted PoA-DD/1/
- The implementation and operation of the project activity has been conducted in accordance with the description contained in the PoA-DD/1/ and included CPA-DDs/2-4/.

- All physical features of the CPA proposed in the included CPA-DDs/2-4/ were in place
- The project participants/CPA implementer has operated the CPAs as per the included CPA DDs/2-4/.
- All sampled users had only 1 unit of project stove

Remote Audit Survey was conducted by the verification team; 11 ICSs wood type (Econofire) and 11 ICSs of charcoal fuel consuming stove (Econochar and CH2200) were checked virtually. The uniqueness of the system was identified from stove serial number written on the cookstove /10/. Along with the unique stove serial No., following details are also noted in the database:

- Name of customer
- Address / location of the customer
- Stove unique serial ID number
- Stove Model
- Stove distribution date
- Type of old / baseline stove replaced by ICS, i.e. the fuel type used in the old / baseline stove

The information of the installed cookstoves was also verified from the CME ICS database/5/ which was cross checked for 22 samples (11 samples for each sampling frame) with the warranty cards/38/. The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the CPA-DDs/2-4/, as given in the table under section E.3.6.5. for comparable estimated ERs in the CPA DDs/2-4/ for the corresponding period.

The energy savings achieved by each CPAs was found to be as follows:

CPA-Reference Number	Total Annual Energy Savings	Threshold Limit
5342-P1-0013-CP1	20.84 GWh <sub>th</sub> /year	180 GWh <sub>th</sub> /year
5342-P1-0014-CP1	27.61 GWh <sub>th</sub> /year	
5342-P1-0015-CP1	20.97 GWh <sub>th</sub> /year	

Thus, the CPAs are within the threshold limits of the applied methodology/6/.

The monitoring report was compared and verified against the description provided in the registered/revised accepted PoA-DD/1/ and found to be correct.

#### Findings

CL#01 and CAR#03 were raised and resolved.

#### Conclusion

The verification team through the remote audit survey and on the basis of the physical site-visit observation during the previous verification confirms that the physical features (technology/type of ICS) of the implementation were in accordance with the registered/revised accepted PoA-DD/01/.

- The distribution of ICS is below the estimated quantity given in the respective CPA-DDs/2-4/.
- The actual operation is in line to the respective CPA-DD, which is further explained under Section E.3 of this report. The total actual achieved CERs for CPAs **5342-P1-0013-CP1**, **5342-P1-0014-CP1**, **5342-P1-0015-CP1** (combined) is significantly less than the estimated ERs for the same period. The reason for the decrease is a limited distribution of ICS as compared to the ex-ante estimated quantity in CPA-DDs. Apart from this, no information about data and variables was identified that may surpass the estimated quantity of ERs in the respective CPA DDs/2-4/.
- The difference in emission reductions achieved by each specific case CPA DD in comparison to that estimated quantity in the corresponding CPA DDs/2-4/ are appropriately justified.

### E.2.2. Implementation and operation of the management system

<b>Means of verification</b>	The verification team, during the Remote Audit Survey, through the interview of the CME representative, Monitoring Personnel and other ICS users, assessed the management system in place to implement the monitoring plan of the PoA. This
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	<p>included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system which was checked during the previous physical inspection /32/ and was reconfirmed through the interview of the monitoring personnel during the current verification. The roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /13/ and were verified through interviews with the CME and other people involved in the project.</p> <p>CME/CPA implementers maintain the CPA distribution records /23/ at the time of distribution to record the details of the end user, ICS model, the serial number of the ICS installed, and the kind of stove replaced. All the information is transferred to ICS distribution database/5/ by the CME which was checked during the desk-review to confirm that the management system is in place. The ICS database was cross-checked against the CPA distribution records of the sampled ICS users to confirm that information for any system installed (unique ID) is consistent between the records. The unique stove serial ID number of the ICS was checked for all the sampled systems during the remote audit survey to ensure that no number is repeating in the database and the same system is not credited in any other CPA either, thus avoiding the double counting.</p> <p>A monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the WBT tests /35/ and monitoring surveys/24/. The monitoring manager of CME is responsible for QA/QC of the data, analysis and reporting in the monitoring report. QA/QC procedures were found being followed as confirmed during the remote audit survey and was also verified at the time of previous verification/32/. Completed monitoring survey forms and WBT test results/24/ and end user agreements cum CPA distribution records /23/were made available to the verification team for assessment of the information of HHs in the CPA installation data and survey and test results mentioned in ER calculator /12/. Monitoring team staff were interviewed by the verification team regarding the monitoring procedures, using the water boiling test and filling the monitoring questionnaires. The verification team also checked training records of the monitoring &amp; data recording personnel/20/.</p> <p>Thus, it can be confirmed that the Implementation and operation of the management system has been done in line with the registered/revised accepted PoA DD/1/ and CPA DDs/2-4/.</p>
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	The verification team from the desk review and remote audit survey assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

### E.2.3. Post-registration changes

#### E.2.3.1. Corrections

No correction proposed or identified.

#### E.2.3.2. Inclusion of a monitoring plan

N/A

#### E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

N/A

#### E.2.3.4. Changes to the programme design

Changes in the programme design were included through PRC-5342-001, which made to expand the project boundary to include Liberia under the PoA. The PRC was approved on 16/07/2014. For more detail, refer the following link:

<https://cdm.unfccc.int/PRCContainer/DB/prcp237694862/view>

**E.2.3.5. Addition of CPA inclusion template**

N/A

**E.2.3.6. Change of coordination/managing entity**

N/A

**E.2.3.7. Changes specific to afforestation and reforestation activities**

N/A

**E.3. Component project activities****E.3.1. Compliance of the CPA implementation with the included CPA design document**

Means of verification	The registered PoA aims at disseminating improved cookstoves in Ghana, Liberia and Nigeria. The PoA is primarily designed to replace the existing traditional three stone cookstove by installing Improved cookstoves instead to provide easy access to clean and affordable energy.				
	CERPD is the implementer of the CPAs and has fully implemented the CPAs with the help of Sales and Distribution Partner (SDP). The same has been verified from the agreement between the CME and CPAI/18/.				
	The monitoring report under verification includes the implementation and monitoring of 3 CPAs- CPA 5342-P1-0013-CP1 to CPA 5342-P1-0015-CP1 in Ghana.				
	CPA Ref. No.	5342-P1-0013-CP1	5342-P1-0014-CP1	5342-P1-0015-CP1	
	First ICS Installation date	17/12/2018	17/12/2018	17/12/2018	
	Inclusion date	12/04/2019	12/04/2019	12/04/2019	
	Crediting period start date	12/04/2019	12/04/2019	12/04/2019	
	Number of systems	Econofire	1,268	756	1,113
		Econochar	1,689	1,975	1,103
		CH2200	1,137	1,348	1,375
Estimated ERs	35,073	35,073	35,073		
Achieved ERs	6,059	8,028	6,099		
All the details were verified from UN webpage/25/, sales database/5/ and the ER sheet/12/. Due to the small number of CH5200 and CH5300 stove units distributed in the current monitoring period, CH5200 and CH5300 is not included in the PoA-Distribution database and in the sampling or monitoring and ER calculations/12/ for claiming ERs, conservatively.					
The verification team confirms that:					
<div>1. Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds(180 GWh or 1.8 GWhth/year) defined by the applied methodology criteria stated in the CPA DD/2-4/ and PoA DD/1/ as verified through the ER sheet/12/.</div> <div>2. The target population is households and communities/SMEs only as verified through remote audit survey.</div>					
The implementation of the CPA as mentioned above is within the geographical boundary of PoA-DD/1/, which constitutes the physical boundary as well. Envirofit International Ltd. is the CME of the CPA and CEPRD Co. Ltd. is the CPAI/18/.					
The reference number and the inclusion date of CPAs have been checked and verified from the UN website/25/ and the details are found correct and consistent. The start date of CPAs was confirmed from the evidence provided /21/. The ICS are installed across Ghana					
The verification team also confirmed the following:					
<div>1. Presence of CME logo on distributed units and record through remote audit survey observation/10/.</div> <div>2. Unique stove ID punched on each stove remote audit survey observation/39/.</div> <div>3. Carbon right transfer through end user agreement/23/.</div>					
The CPAs have been implemented in line with the CPA DDs/2-4/.					

<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	<ul style="list-style-type: none"> <li>a) The verification team is of the opinion that physical features of the CPA have been implemented in accordance with the registered CPA-DDs/2-4/.</li> <li>b) No specific monitoring equipment had to be installed according to the monitoring plan.</li> <li>c) It is also confirmed, through the interview of the CME representatives and review of the supporting documentation that physical features of the component CPA have been implemented in accordance with the CPA-DDs/2-4/.</li> <li>d) The CPAs were also found to be completely operational in line with the CPA-DDs/2-4/.</li> <li>e) The information provided in the relevant sections of the monitoring report are appropriately describe the implementation and operational status of the PoA</li> <li>f) The verification team also confirms that monitoring periods are consecutive.</li> </ul>

### E.3.2. Post-registration changes

#### E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

During the current monitoring period 01/07/2019 – 31/03/2020, the CME has proposed a post-registration change for the entire monitoring period as the CME has distributed the stove models CH5300 and CH5200 in small numbers (less than 5% of total population). CME has not included these stoves models in sampling, monitoring. Conservatively, the CME has claimed no ERs for these two models for this non-conforming monitoring period of 9 months i.e. from 01/07/2019 – 31/03/2020. The change falls under the category of temporary deviation from the registered monitoring plan as per para 228 of PS for PoA/7/.

The proposed alternative monitoring arrangements produce a conservative estimate of greenhouse gas (GHG) emission reductions or net anthropogenic GHG removals as demonstrated in the PRC validation opinion/51/. Thus, the PRC request will be submitted along with the issuance as per Appendix 1 of PS for PoA version 2.0. Please refer to the PRC report for details/51/.

#### E.3.2.2. Corrections

NA

#### E.3.2.3. Changes to the start-date of the crediting period

No changes to the start date of crediting period.

#### E.3.2.4. Inclusion of a monitoring plan

NA

#### E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

NA

#### E.3.2.6. Changes to the project design

NA

#### E.3.2.7. Changes specific to afforestation and reforestation activities

NA

### E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

<b>Means of verification</b>	The monitoring plan as contained in CPA-DDs/2-4/ was reviewed against the monitoring requirements of the applied methodology AMS-II. G version 03 /6/ as well as PoA-DD/1/ regarding the technology involved. Based on this review, it was found that the monitoring plan contained in the CPA DDs/2-4/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD/1/ and applied methodology AMS-II.G version 03/6/.
<b>Findings</b>	None.
<b>Conclusion</b>	The monitoring plan is in line with the approved methodology AMS II.G Ver.3/6/.

	that is included in the CPA-DDs/2-4/.
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**E.3.4. Compliance of monitoring activities with the registered monitoring plan****E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period****Annual average biomass consumption per appliance, Tonnes/year,  $Q_{\text{biomass}}$** 

<b>Means of verification</b>	The value of the parameter is fixed at CPA and has been calculated as per the applied methodology/6/. The value for firewood stoves and charcoal stoves is 1.90 and 4.10, respectively. It was checked from the CPA-DDs/2-4/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA DDs/2-4/. The applied value is correct and justified.

**Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass, Fraction,  $f_{\text{NRB},y}$** 

<b>Means of verification</b>	The value of the parameter is fixed at the time of first CPA and has been calculated as per the data extracted from FAO and IPCC. The value of the parameter applied in the ER sheet is 0.99 which is consistent with the CPA-DDs/2-4/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

**Net calorific value of the non-renewable biomass that is substituted, TJ/tonne,  $\text{NCV}_{\text{biomass}}$** 

<b>Means of verification</b>	The value of the parameter is 0.015 which is a default value stated by the applied methodology/6/ and was checked from the CPA-DDs/2-4/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

**Emission factor for the substitution of non-renewable woody biomass by similar consumers,  $\text{tCO}_2/\text{TJ}$ ,  $\text{EF}_{\text{projected\_fossilfuel}}$** 

<b>Means of verification</b>	The value of the parameter is 81.6 which is a default value stated by the applied methodology/6/ and was checked from the CPA-DDs/2-4/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

**Efficiency of the system being replaced, Fraction,  $\eta_{\text{old}}$** 

<b>Means of verification</b>	The value of the parameter is 0.101 which was determined at the time of first CPA inclusion through the default values stated by the applied methodology/6/ for replacing traditional and improved stove by multiplying it with their respective penetration rates. The value found to be consistent between CPA-DDs/2-4/, MR/13/ and ER calculation sheet/12/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

**Net to gross adjustment factor to account for leakages, Fraction, LAF**

<b>Means of verification</b>	The value of the parameter is 0.95 which is a default value sourced from the applied methodology/6/. The value was found to be consistent between the CPA-DDs/2-4/ and ER sheet/12/.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The value in the monitoring report and corresponding emission reduction

calculations spreadsheet/12/ are consistent with the CPA-DDs/2-4/. The applied value is correct and justified.

### E.3.4.2. Data and parameters monitored

Efficiency of the device being deployed as part of the project activity in year y, %,  $\eta_{\text{new},y}$

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	Yes. Moisture meter, Digital Thermometer and Weighing Scale were used.  Refer section E.3.5. of this report for a detailed assessment of calibration of monitoring equipment.
	How were the values in the monitoring report verified?	The efficiency of the stoves deployed were as follows:  i) Econofire = 28.87% ii) Econochar= 33.19% iii) CH2200 = 36.38%  The efficiency has been calculated through the WBT test performed on sampled number of stoves. The sample size was determined following PoA sampling plan/1/. The WBT tests were performed for 27 stoves in all (9 stoves per ICS model) as checked from the WBT calculation sheet presented in the ER calculation sheet/12/.  The end users surveyed confirmed that their stove was picked up for WBT and another stove was given to them. The team was able to confirm the Unique serial IDs of both old and new stoves through observation of the stove and the end user agreement/23/.  The values given in the ER sheet/12/ were checked with WBT sheets/35/ and found to be correct. The test has met the required confidence and precision.  The team confirms that the applied value is correct and justified.
	If applicable, has the reported data been cross-checked with other available data?	Yes. The efficiency values were cross-checked as stated in the ER calculation sheet with the design efficiency stated in the CPA-DDs and revised accepted PoA-DD/2-5/,/1/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary	The CME has provided the training evidences/36/ and list of persons involved/29/ in conducting the WBT to

	QA/QC processes in place?	<p>confirm that QA/QC procedure are followed in line with the registered monitoring plan.</p> <p>Also, during the remote audit survey, one of the WBT personnel was interviewed to confirm that the WBT tests are conducted in-line with the registered monitoring plan.</p> <p>Following questions were asked during the interview of the WBT Personnel:</p> <ul style="list-style-type: none"> <li>• Name of the Person</li> <li>• Qualification of the WBT personnel</li> <li>• WBT Procedure</li> <li>• Team composition</li> <li>• WBT Training procedure</li> </ul>
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
<b>Findings</b>	CAR#02 was raised and resolved	
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

**Total number of stoves installed, Number, Nall**

Means of verification	Criteria/Requirements	Assessment/Observations															
	Measuring /Reading /Recording frequency	Annually.															
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.															
	Monitoring equipment	NA															
	How were the values in the monitoring report verified?	<p>The values stated in the MR are as following:</p> <table><tr><td>Parameter</td><td>5342-P1-0013-CP1</td><td>5342-P1-0014-CP1</td><td>5342-P1-0015-CP1</td></tr><tr><td>N<sub>wood</sub></td><td>1,268</td><td>756</td><td>1,113</td></tr><tr><td>N<sub>Charcoal</sub></td><td>2,826</td><td>3,323</td><td>2,478</td></tr><tr><td>N<sub>all</sub></td><td>4,094</td><td>4,079</td><td>3,591</td></tr></table> <p>The parameter is recorded for each sale in the ICS database/5/.</p> <p>The CME also keeps end user agreement as installation evidence/23/.</p> <p>Each stove has Unique serial ID, which is mentioned in the ICS database and claims for ERs.</p>	Parameter	5342-P1-0013-CP1	5342-P1-0014-CP1	5342-P1-0015-CP1	N <sub>wood</sub>	1,268	756	1,113	N <sub>Charcoal</sub>	2,826	3,323	2,478	N <sub>all</sub>	4,094	4,079
Parameter	5342-P1-0013-CP1	5342-P1-0014-CP1	5342-P1-0015-CP1														
N <sub>wood</sub>	1,268	756	1,113														
N <sub>Charcoal</sub>	2,826	3,323	2,478														
N <sub>all</sub>	4,094	4,079	3,591														

		<p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>The entries in database were checked to confirm the total number presented in the MR/13/. 11 samples (for each sampling frame i.e., total 22 ICSs) were Remotely audited by the assessment team.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (22) were checked with the installation invoices/26/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Representatives of the CME working the host country were interviewed to understand and confirm that the database management is done in line with the registered monitoring plan.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
<b>Findings</b>	CAR#02 and CL#02 were raised and resolved.	
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

**Stove Operation Fraction – used to determine the share of distributed stoves that are still operating, measured ex-post through sampling, Fraction, SOF**

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The values stated in the MR are as following:</p> <p>SOF<sub>charcoal</sub>: 0.963</p> <p>SOF<sub>wood</sub>: 0.979</p> <p>This parameter is monitored ex-post through sampling. 127 Samples total were monitored by the CME.</p> <p>Based on the user survey data collected, the parameter was calculated, and the values applied can be verified from the monitoring survey sheet/12/</p> <p>22 samples (11 of each fuel type-charcoal or wood) were remotely surveyed by the verification team to confirm the result presented in the</p>

		<p>survey sheet/11,12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to contain consistent information flow.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
<b>Findings</b>	CAR#02 was raised and resolved.	
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

#### Fraction of end users that are still using baseline stoves, Fraction, $f_{old}$

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined through survey and applying a simple formula to survey result:</p> $f_{old} = 1 - f_{non-old} \text{ (people not using old stove/total Envirofit stove users)}$ <p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <p><math>f_{old\_charcoal}</math>: 0.104</p> <p><math>f_{old\_wood}</math>: 0.283</p> <p>For survey 77 samples for <math>f_{old}</math> charcoal and 46 samples for <math>f_{old}</math> woodfuel (total 123) were monitored by the CME.</p> <p>Thus, parameter is calculated through monitoring of users not using baseline stoves (<math>f_{nonold}</math>) as stated in the CPA-DD/2-4/.</p> <p>Based on the end user survey the</p>



		<p>parameter was calculated and the values applied can be verified from the monitoring survey summary presented in the ER sheet/11,12/</p> <p>22 samples (11 of each stove type – charcoal or wood) were surveyed by the verification team during the remote audit survey to confirm the result presented in the survey sheet/12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>It is noteworthy that for <math>f_{old\_wood}</math>, the required precision was not met. Thus, the CME has applied lower bound to the value of <math>f_{non-old\_wood}</math> to get a higher value of <math>f_{old\_wood}</math> which is a conservative value. Thus, meeting the registered sampling plan requirement.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to be have same information.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
<b>Findings</b>	CAR#02 was raised and resolved.	
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

**The amount of woody biomass consumption that is consumed through the continued use of old stoves, kg/year,  $\mu$ old**

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	The parameter is determined through survey and applying following formula to survey result: $\mu_{old} = (MPM_{after\ ICS} / MPM_{before\ ICS} * Total$

		<p>annual fuel consumption(kg)</p> <p>During the survey, the end users are asked for the number of meals they prepare on baseline stove and on project stove to calculate the value of MPM before and after ICS use.</p> <p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <p><math>\mu_{old\_charcoal}</math>: 1,324</p> <p><math>\mu_{old\_wood}</math>: 574</p> <p>Based on the end user survey the parameter was calculated and the values applied can be verified from the monitoring survey summary presented in the ER sheet/11,12/</p> <p>22 samples surveyed (11 of each fuel type – charcoal and wood) were surveyed by the verification team during the remote audit survey to confirm the result presented in the survey sheet/11,12/.</p> <p>No discrepancies were found in the observations recorded during the remote survey.</p> <p>Thus, it can be confirmed that the applied value has been correctly determined and applied.</p>	
	If applicable, has the reported data been cross-checked with other available data?	Yes. The results presented in the ER sheet/12/ were checked with monitoring survey forms/24/ and found to be have same information.	
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes	
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA	
<b>Findings</b>	CAR#02 and CL#03 were raised and resolved.		
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.		

Calculated average stove operation years in the monitoring period. If stoves have been operating for 365 days, then  $\text{Stove}_{\text{year}} = 1.0$ . If less than 365 days, then  $\text{Stove}_{\text{year}}$  is represented as a fraction of 365 (eg. 180 days= 0.5), Year,  $\text{Stove}_{\text{year}}$

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually.

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.												
	Monitoring equipment	NA												
	How were the values in the monitoring report verified?	<p>The parameter is calculated for all the stoves disseminated under the CPAs by considering their date of installation and calculating the total number of days for which they operated in the current monitoring period.</p> <p>The values obtained in the ER sheet/11,12/ and the MR/13/ are as following:</p> <table border="1"> <tr> <th>Parameter</th> <th>5342-P1-0013-CP1</th> <th>5342-P1-0014-CP1</th> <th>5342-P1-0015-CP1</th> </tr> <tr> <td>STOVE<sub>yearwood</sub></td> <td>0.67</td> <td>0.68</td> <td>0.68</td> </tr> <tr> <td>STOVE<sub>yearcharcoal</sub></td> <td>0.57</td> <td>0.72</td> <td>0.66</td> </tr> </table> <p>The above values were checked in the ER sheet/12/ for the calculation and found to be correct.</p> <p>The total stoves considered for calculating average values of stove year in the ER sheet/12/ are same as the number of stoves listed in the ICS database/5/.</p>	Parameter	5342-P1-0013-CP1	5342-P1-0014-CP1	5342-P1-0015-CP1	STOVE <sub>yearwood</sub>	0.67	0.68	0.68	STOVE <sub>yearcharcoal</sub>	0.57	0.72	0.66
	Parameter	5342-P1-0013-CP1	5342-P1-0014-CP1	5342-P1-0015-CP1										
	STOVE <sub>yearwood</sub>	0.67	0.68	0.68										
	STOVE <sub>yearcharcoal</sub>	0.57	0.72	0.66										
If applicable, has the reported data been cross-checked with other available data?	Yes. The entries in the ICS database/5/ were checked with end user agreement/23/ and through the interview of the end-users during the remote audit survey.													
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes													
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA													
<b>Findings</b>	CAR#02 was raised and resolved.													
<b>Conclusion</b>	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.													

#### E.3.4.3. Implementation of sampling plan

<b>Means of verification</b>	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2-4/.</p> <p><b>Sampling Design/Target Population/Sampling Frame/Reliability:</b></p> <p>The CME has applied single sampling plan for all the 3 CPAs. According to the 'Sampling and Survey standards,' version 8.0/15/, the sampling plan applied by the</p>
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CME for the concerned CPAs are found to be appropriate. As per the sampling plan stated in the PoA DD/1/, a minimum 95% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters whenever cross-sampling takes place. The CME has followed a frequency of annual monitoring. Since the sampling has been done across the CPAs, the CME has taken 95/10 as the confidence precision levels which is found to be in line with the registered monitoring plan/1,2-4/.

The target population for the parameters stated above are ICS installed and recorded in the project ICS database/5/.

#### **Sampling Frame:**

All the stoves are homogeneous for their location, target population. However, there are two different type of ICS used by the end users under the CPAs based on their different fuel type: Wood based ICS (Econofire stoves) and charcoal - based ICS (Econochar stoves, CH2200, CH5200 and CH5300). Due to the small number of CH5200 and CH5300 stove units distributed in the current monitoring period, stove models CH5200 and CH5300 are not included in monitoring and ER calculations for claiming ERs, conservatively and temporary deviation has been sought by the CME during the current monitoring period for the same refer to the PRC validation opinion for the detailed review of the same/51/. Therefore, wood stoves-Econofire and charcoal stove-Econochar/CH2200 have been considered in different sampling frames.

#### **Sampling Method and selection:**

The samples have been chosen randomly from both the frames as checked from screenshots of online random number generator/37/.

#### **Sample Size for Parameter of Interest:**

The sampling is applied to the following monitoring parameters:

- The thermal efficiency of the ICS distributed (%),  $\eta_{new,y}$
- The Stove Operating Fraction, i.e. the fraction of users using the ICS, SOF
- The fraction of stove users still using baseline (replaced) stoves,  $f_{old}$
- The amount of woody biomass that continues to be used in the replaced stoves (kg),  $\mu_{old}$

The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 4.0/14/.

In this regard, sample size calculation spreadsheet /12/ was checked and found correct as per registered monitoring plan. The complete details are given in section E.3 of Monitoring Report/13/.

#### **Implementation of Sampling Survey and Field Test Records:**

Besides interviewing the CME, sampled HHs and surveyors during the Remote Audit Survey, the verification team also checked the training records of the personnel conducting monitoring surveys and tests/36/. The verification team also interviewed the personnel involved in the monitoring during the remote audit survey. Therefore, the implementation of surveys and tests was considered reliable.

#### **Monitoring survey (by CME) duration:**

The monitoring surveys were conducted from 15/04/2020 to 08/05/2020 and WBT tests were conducted from, 03/05/2020 to 18/05/2020.

#### **Reliability and precision calculation:**

The verification team has verified the ER calculation spreadsheets /12/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and Programme of Activities" v8.0 /15/ and confirms that the calculation of

	<p>achieved reliability was done correctly.</p> <p>All parameters of interest are included in the ER spreadsheet for the CPAs. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets/12/ corresponding to final Monitoring Report /13/, which were also found correct.</p> <p>Thus, the verification team confirms that in all cases the reliability has been demonstrated and the results are reliable.</p>
<b>Findings</b>	CL#02 was raised and resolved.
<b>Conclusion</b>	The verification team has found out that the sampling plan has not been applied in-line with the monitoring plan mentioned in the registered PoA-DD/1/ and CPA-DDs/2-4/ and Sampling and survey standards, ver.8.0/15/ for CH5200 and CH5300 stoves. Thus, CME has sought temporary deviation from the registered monitoring plan during the current monitoring period for these stove model types CH5300 and CH5200 which have been implemented in small numbers but have not been considered for monitoring, sampling and emission reduction calculation.

### E.3.5. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	<p>The monitoring plan (included in CPA DDs/2-4/ and registered PoA DD/01/) does not state the calibration requirements for any of the parameter. However, the verification team has checked if the monitoring equipment used during WBT test (mass balance, moisture meter and thermometer) were duly calibrated. As a result, following information was verified from the purchase invoice/30/ of the equipment used for thermal efficiency test;</p>				
	Equipment	Sr. No.	Name of Manufacturer	Name of Model	Measuring range - Measurement Accuracy
	Thermometer	1861053	Proster	Digital Dual Channel Thermometer	-200 °C to 1767 °C (R-N-S type) +/- 1.5%
	Mass Balance	20190102318	WKA	WKA ZD30	(20g - 30 kg) accurate to 1 g
	Moisture Meter	RZ MT-10	Proster	PST049	0 % - 99.9% 0.5 %
	<p>The date of purchase of monitoring equipment used for WBTs is 01/08/2019 as checked from the purchase invoice in-order/30/ to ensure that the tests have been conducted with newly purchased and calibrated instrument. The WBTs were conducted during the period 03/05/2020 to 17/05/2020.</p> <p>In the absence of manufacturer specified validity of the calibration, the “General Guidelines to SSC CDM methodologies” is applied. As per the guidelines as per “General Guidelines to SSC CDM methodologies” EB 61, Annex 21/31/, para 17 (c): “Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years”. Hence, the instrument can be considered calibrated till three years from the date of purchase.</p>				
<b>Findings</b>	CAR#02 was raised and resolved.				
<b>Conclusion</b>	The verification team confirm that CME applied good practices (as per manufacturer recommendation) while using the monitoring equipment and these were under the state of calibration. There is no specific requirement prescribed in this regard in the registered monitoring plan/01/ and in monitoring methodology/6/. Therefore, the approach presented by CME was accepted.				

### E.3.6. Assessment of data and calculation of emission reductions or net removals

#### E.3.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	The following equations were used to determine the baseline emissions as provided in the monitoring report /13/ and applied in the corresponding ER calculations sheet /12/. The expressions used were found consistent with the PoA
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DD /1/, CPA DDs /2-4/ and the applied methodology AMSII.G, version 03 /6/:

$$ER_y = B_{y,savings} \cdot f_{NRB} \cdot NCV_{biomass} \cdot EF_{projected\_fossilfuel}$$

Where:

$ER_y$	Emission reductions during the year y in tCO <sub>2</sub> e.
$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes
$f_{nrB}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass.
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected\_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO <sub>2</sub> /TJ

$$B_{y,savings} = B_{old} \cdot \left( 1 - \frac{\eta_{old}}{\eta_{new}} \right)$$

$B_{old}$	Quantity of woody biomass used in the absence of the project activity in tonnes.
$\eta_{old}$	Efficiency of system being replaced
$\eta_{new}$	Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity.

$$B_{old} = LAF \cdot N_{all} \cdot SOF \cdot (Q_{biomass} - \left( \frac{\mu_{old}}{1000} \cdot f_{old} \right)) \cdot Stove_{year}$$

Where,

$B_{old}$ : Quantity of woody biomass used in the absence of the project activity in tonnes.

LAF: Net leakage adjustment factor

The duration of monitoring period is from 01/07/2019 to 31/03/2020 and the crediting period start date of the CPAs covered in the MR is 12/04/2019 and thus the CME has claimed the ERs only after the start date of the crediting period.

The verification team has checked that the calculations for the 3 CPAs (CPA 007(5342-P1-0013-CP1), CPA 008(5342-P1-0014-CP1) and CPA 009(5342-P1-0015-CP1) ) have been done correctly in the worksheet 'ERs Summary' /12/.

The calculations for all the CPAs were checked in the ER sheet/12/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied methodology/6/. The ex-ante values applied were also found to be consistently applied in line with the PoA and the CPA DDs/1-4/

All the parameters are assessed in detail under section E.3.4. of this report.

<b>Findings</b>	No findings were raised
<b>Conclusion</b>	<p>The verification team confirms that</p> <p>a) The complete data was available and is duly reported.</p> <p>b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter above.</p>

	<p>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed.</p> <p>d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied.</p> <p>e) There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</p>
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### E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

<b>Means of verification</b>	As per applied methodology/6/, single equation is provided for the emission reduction calculation without any separate calculations for baseline emissions, project emissions or leakages related to the project. Hence, PE is not applicable in this case.
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	The Project emission is not applicable, and the approach is in-line with the applied methodology.

### E.3.6.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	As per applied methodology/6/, single equation is provided for the emission reduction calculation without any separate calculations for baseline emissions, project emissions or leakages related to the project. 0.95 is applied as net to gross leakage adjustment factor to the ER calculation as per methodology/6/.
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	The leakages could not be calculated, and the approach is in-line with the applied methodology.

### E.3.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

<b>Means of verification</b>	<p>As elaborated above, the entire emission reductions from the PoA were based on the baseline emissions. The calculations presented in this regard in the monitoring report /13/ and the corresponding ER sheet /12/ were found appropriate and complying with provisions prescribed in the registered monitoring plan/1/ of the respective CPA-DDs/2-4/, PoA-DD/1/ and applied methodology/6/</p> <p>The verification team affirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found legitimate.</p>
<b>Findings</b>	CAR#01 was raised and resolved
<b>Conclusion</b>	<p>The verification team confirms that:</p> <ol style="list-style-type: none"> <li>The complete data of the stove models considered for ER calculation during the current monitoring period was available and is duly reported.</li> <li>As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.3.4.2 of this report).</li> <li>Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed.</li> <li>Appropriate emission factors, IPCC default factors and other reference values were correctly applied.</li> <li>There is no pro-rata approach was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.</li> <li>The total number of ERs achieved during the current monitoring period is 20,186 tCO<sub>2</sub>e.</li> </ol>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (tCO <sub>2</sub> e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
African Improved Cooking Stoves Programme of Activities CPA 00007 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0013-CP1	6,059	0	0	0	6,059	6,059
African Improved Cooking Stoves Programme of Activities CPA 00008 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0014-CP1	8,028	0	0	0	8,028	8,028
African Improved Cooking Stoves Programme of Activities CPA 00009 (Ghana) supported by Republic of Korea Version: 2.0 Ref: 5342-P1-0015-CP1	6,099	0	0	0	6,099	6,099
<b>Total</b>	20,186	00	00	00	20,186	20,186

#### E.3.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

<b>Means of verification</b>	<p>Earthood Services Private Limited can certify that the emission reductions from the CDM project activity 5342 "African Improved Cooking Stoves Programme of Activities" in Ghana for the monitoring period 01/07/2019-31/03/2020 (including both days) amount to 20,186 tCO<sub>2</sub>. The achieved and estimated ERs are presented in the next table. The achieved ERs are lower as compared to the estimated ERs due to lesser number of installations done under each CPA. Since the achieved ERs are lower than the estimated, no further justification was sought.</p> <p><b>Verified and certified emission reductions as per commitment period:</b></p> <table> <tr> <th>Commitment period</th><th>Amount</th></tr> <tr> <td>Upto 31/12/2012 (1<sup>st</sup> commitment period)</td><td>0 tCO<sub>2</sub>e</td></tr> <tr> <td>From 01/01/2013</td><td>20,186 tCO<sub>2</sub></td></tr> </table>	Commitment period	Amount	Upto 31/12/2012 (1 <sup>st</sup> commitment period)	0 tCO <sub>2</sub> e	From 01/01/2013	20,186 tCO <sub>2</sub>
Commitment period	Amount						
Upto 31/12/2012 (1 <sup>st</sup> commitment period)	0 tCO <sub>2</sub> e						
From 01/01/2013	20,186 tCO <sub>2</sub>						
<b>Findings</b>	No findings were raised.						
<b>Conclusion</b>	The actual ERs achieved in included CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2-4/. Accordingly, it was accepted by verification team.						



Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
5342-P1-0013-CP1	6,059	35,073
5342-P1-0014-CP1	8,028	35,073
5342-P1-0015-CP1	6,099	35,073
<b>Total</b>	<b>20,186</b>	<b>105,219</b>

**E.3.6.6. Remarks on difference from estimated value in included CPA**

<b>Means of verification</b>	As verified and evident from the Monitoring Report /13/ and corresponding ER calculations sheet /12/, the actual emission reductions achieved for Improved Cookstoves for the CPAs under this verification in the current monitoring period were found less than the estimated quantity in the CPA-DDs/2-4/ for the comparable period. The lower number of ERs are due to a smaller number of installations done under the CPAs as compared to estimated distribution number. Considering there is no increase in ERs no further verification effort was put in. The details of actual values of achieved ERs for the CPA and value estimated in the CPA-DDs/2-4/ is presented in the table above.
<b>Findings</b>	None
<b>Conclusion</b>	The actual emission reductions achieved in any of specific CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2-4/. Accordingly, it was accepted by the verification team.

**E.3.7. Assessment of reported sustainable development co-benefits**

<b>Means of verification</b>	The coordinating/managing entity did not identify and establish the monitoring of the sustainable development benefits of the registered CDM PoA/1/ and no such document was developed and published on the UNFCCC CDM website/25/. Therefore, no assessment is required.
<b>Findings</b>	None
<b>Conclusion</b>	The CME is not required to monitor the sustainable development benefits of the registered CDM PoA.

**E.3.8. Global stakeholder consultation**

<b>Means of verification</b>	The global stakeholder consultation was not found applicable because period under verification is seventh monitoring period.
<b>Findings</b>	None
<b>Conclusion</b>	The requirement is applicable for situations when global stakeholder consultation was carried out after the publication of first monitoring report. Therefore, this was not found applicable

**SECTION F. Internal quality control**

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team

During the technical review process additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized on behalf of Earthood Services Private Limited.

## SECTION G. Verification opinion

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Earthood Services Private Limited (ESPL), contracted by Envirofit (the CME for the PoA), has performed the independent verification of the emission reductions for the registered CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" for the seventh monitoring period 01/07/2019-31/03/2020 (both days included) as reported in the Monitoring Report (final) Version 4.1 dated 20/08/2020. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

This verification report is for the PoA-5342 which involves the verification of CPAs (5342-P1-0013-CP1 to 5342-P1-0015-CP1) that has been included in the PoA before the end of the current monitoring period.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template specified by UNFCCC and complies with the instructions to follow of CDM VVS-PoA Version 02.

The verification activities were conducted in accordance with ESPL's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the included CPAs confirm to the revised accepted PoA-DD as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodologies, AMS II.G (Version 03).

As a result, it is confirmed that the emission reductions from the CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" are correctly reported in the Monitoring Report Version 4.1 dated 20/08/2020 and corresponding ER sheets for the monitoring period 01/07/2019-31/03/2020 (including both days) amount as 20,186 tCO<sub>2</sub>e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 02.

## SECTION H. Certification statement

Earthood Services Private Limited (ESPL), contracted by Envirofit (the CME for the PoA), has performed the independent verification of the emission reductions for the registered CDM PoA 5342 "African Improved Cooking Stoves Programme of Activities" in Ghana for the seventh monitoring period 01/07/2019-31/03/2020 (both days included) as reported in the Monitoring Report (public) Version 1.0 dated 16/05/2020.

The verification is based on the registered PoA-DD, CPA-DDs and the monitoring report for this project. ESPL's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board.

The management of the Envirofit International Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions as set out in the project Final Monitoring Report Version 4.1 dated 20/08/2020. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of Envirofit International Ltd.. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 4.1 dated 20/08/2020.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period 01/07/2019-31/03/2020 (including both dates) based on the reported emission reductions in the Final Monitoring Report Version 4.1 dated 20/08/2020 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, ESPL planned and performed work to obtain the information and explanations that we considered necessary to provide sufficient evidence to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

ESPL confirms the following;

**Monitoring period:** From 01/07/2019 up to 31/03/2020 (including both dates)

**Verified and certified emission in the above monitoring period:**

**Amount**

**Unit**

## Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating or Managing Entity
CPA	Component Project Activity
CP	Crediting period
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
ESPL	Earthood Services Private Limited
FAR	Forward action request
GHG	Green House Gases
GS	Gold standard
ICS	Improve Cook Stoves
IPCC	Intergovernmental Panel on Climate change
POA	Programme Of Activity
PO	Partner Organization
PSU	Primary Sampling Unit.
TA	Technical Area
TR	Technical Reviewer
VVS	Validation and Verification Standard
UNFCCC	United Nation Framework convention on Climate change
WBT	Water Boiling Test

## Appendix 2. Competence of team members and technical reviewers

Competence Statement	
<b>Name</b>	Deepika Mahala
<b>Country</b>	India
<b>Education</b>	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU
<b>Experience</b>	3 Years +
<b>Field</b>	Climate Change
Approved Roles	
<b>Team Leader</b>	YES
<b>Validator</b>	YES
<b>Verifier</b>	YES
<b>Methodology Expert</b>	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G

<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.2 & TA 3.1)		
<b>Reviewed by</b>	Shreya Garg	<b>Date</b>	14/09/2018
<b>Approved by</b>	Anshika Gupta	<b>Date</b>	14/09/2018

Competence Statement			
Name	Vaishali Vatsa		
Education	M.Sc. (Environmental Studies and Resource Management), TERI University		
Experience	4 months		
Field	Climate Change		
Approved Roles			
Team Leader	NO		
Validator	Yes		
Verifier	Yes		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	NO		
Reviewed by	Shreya Garg	Date	30/12/2019
Approved by	Anshika Gupta	Date	02/01/2020

Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AMS III.AR, AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B, ACM0003		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	Date	25/05/2020

Approved by	Kaviraj Singh	Date	25/05/2020
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Competence Statement			
Name	Moses Dada Wealth		
Country	Ghana		
Education	Advanced Diploma (Chemical Engineering)		
Experience	7 years +		
Field	Water Treatment, Oil Storage and Transporting		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (Ghana)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	NO		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Envirofit International Ltd	Registered PoA-DD Revised accepted PoA DD	Version 3.2, dated 27/11/2012 Version 4.3 Dated:07/06/2014	Others
2	Envirofit International Ltd	Registered CPA-DD-007 (5342-P1-0013-CP1)	Version 2.0 Dated:15/03/2019	Others
3	Envirofit International Ltd	Registered CPA-DD-008 (5342-P1-0014-CP1)	Version 2.0 Dated:15/03/2019	Others
4	Envirofit International Ltd	Registered CPA-DD-009 (5342-P1-0015-CP1)	Version 2.0 Dated:15/03/2019	Others
5	Envirofit International Ltd	ICS Database	-	CME
6	UNFCCC	AMS-II.G.- Energy efficiency measures in thermal applications of non-renewable biomass	Version 3.0	Others
7	UNFCCC	Project Standard for PoA (PS)	Version 2.0	Others
8	UNFCCC	Project Cycle Procedure for PoA (PCP)	Version 2.0	Others
9	UNFCCC	Validation and Verification Standard for PoA (VVS)	Version 2.0	Others
10	ESPL	Remote Audit assessment files (survey sheets)	22/06/2020-23/06/2020	Others
11	Envirofit International Ltd	Usage and Monitoring survey data (presented in the ER sheet)	19/06/2020	CME

**CDM-PoA-VCR-FORM**

12	Envirofit International Ltd	ER calculation sheet	14/08/2020	CME
13	Envirofit International Ltd	Monitoring Report (public) Monitoring Report (final)	Version 1.0 dated 16/05/2020 Version 4.1 dated 20/08/2020	CME
14	UNFCCC	Guidelines for Sampling and Surveys for CDM project activities and Programme of activities	version 4.0	Others
15	UNFCCC	Standards for Sampling and Surveys for CDM project activities and programme of activities	Version 8.0	Others
16	Carbon Check	PoA PRC Validation opinion	Version 2.0 Dated 28/02/2014	Others
17	UNFCCC	CDM Monitoring Form for PoA (CDM-PoA-MR-FORM)	Version 3.0	Others
18	Envirofit International Ltd	CME and CPA implementer agreement	01/11/2018	CME
19	Envirofit International Ltd	Stove specification	-	CME
20	Envirofit International Ltd	Training manual for monitoring	-	CME
21	Envirofit International Ltd	CPA start date evidence -date of first shipment of ICS	17/12/2018	CME
22	Germanischer Lloyd Certification GmbH	PoA Validation report	Version 11, Dated 15/12/2012	Others
23	Envirofit International Limited	End User Agreement	Various	CME
24	Envirofit International Limited	Monitoring Survey forms/Records	15/04/2020-08/05/2020	CME
25	UNFCCC	PoA Link: <a href="https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/4R62VM8H3CFJDZTAXYQEL7119NBPWO/viewCPAs">https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/4R62VM8H3CFJDZTAXYQEL7119NBPWO/viewCPAs</a>	-	Others
26	Envirofit International Limited	Training Attendance	13/04/2020	CME
27	TUV NORD CET GmbH	Inclusion report for CPA 007(5342-P1-0013-CP1), CPA 008(5342-P1-0014-CP1) and CPA 009(5342-P1-0015-CP1)	Version 1.0 08/04/2019	Others
28	GACC	EPTP Protocol-GACC	-	CME
29	Envirofit	List of persons involved in WBT	-	CME
30	The Dukes Engineering	Monitoring Equipment Purchase Invoice	01/08/2019	CME
31	UNFCCC	General Guidelines to SSC CDM methodologies EB 61, annex 21	-	Others
32	ESPL	Verification report for MP6	Version 2.0, Dated 06/11/2019	Others
33	Envirofit International Ltd	Stove test pictures	-	CME
34	Envirofit International Ltd	Equipment pictures	-	CME
35	Envirofit International Ltd	WBT Forms / Records	03/05/2020 to 18/05/2020	CME
36	Envirofit International Ltd	WBT training certificates	-	CME
37	Envirofit International	Screenshot of random number	-	CME

	Ltd	generated for sampling		
38	Envirofit International Ltd	Warranty Information Note	-	CME
39	Envirofit International Ltd	Photographs of ICSs	-	
40	Envirofit International Ltd	Installed ICSs with Unique Product IDs	-	
41	Envirofit International Ltd	ERPA	-	
42	world meters	<a href="https://www.worldometers.info/coronavirus/worldwide-graphs/">https://www.worldometers.info/coronavirus/worldwide-graphs/</a>	-	Other
43	BBC News	Coronavirus: Tracking the global Outbreak <a href="https://www.bbc.com/news/world-51235105">https://www.bbc.com/news/world-51235105</a>	-	Other
44	Bureau of Immigration	Advisory: Travel and Visa restrictions	13/03/2020	Other
45	Envirofit International Ltd.	WBT efficiency calculator	-	CME
46	Envirofit International Ltd.	WBT replacement list	-	CME
47	Emmanuel Debrah	The Cost of Inter-Ethnic Conflicts in Ghana's Northern Region: The Case of the Nawuri-Gonja Conflicts	Aug 2016	Other
48	latlong	<a href="https://www.latlong.net/c/?lat=7.946527&amp;long=-1.023194">https://www.latlong.net/c/?lat=7.946527&amp;long=-1.023194</a>	-	Other
49	Economic times	<a href="https://economictimes.indiatimes.com/industry/transportation/airlines/-aviation/suspension-of-international-flights-from-india-extended-till-31st-august-says-dgca/videoshow/77302326.cms">https://economictimes.indiatimes.com/industry/transportation/airlines/-aviation/suspension-of-international-flights-from-india-extended-till-31st-august-says-dgca/videoshow/77302326.cms</a>	01/08/2020	Other
50	Department of State-USA	Ghana travel Advisory: <a href="https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories/ghana-travel-advisory.html">https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories/ghana-travel-advisory.html</a>	-	Other
51	ESPL	PRC validation opinion	23/11/2020	Others

## Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FARs from validation and/or previous verification

FAR ID	xx	Section No.	Date: DD/MM/YYYY
<b>Description of FAR</b>			
No FAR from the previous verification			
<b>CME response</b>			<b>Date: DD/MM/YYYY</b>
XX			
<b>Documentation provided by the CME</b>			
XX			
<b>DOE assessment</b>			<b>Date: DD/MM/YYYY</b>
XX			

Table 2. CLs from this verification

CL ID	01	Section no.	E.2.1	Date : 24/06/2020
<b>Description of CL</b>				

Section C.1 of the MR (Version 1.0, dated: 15/06/2020) enlists four models of charcoal fuel type (i.e. CH5300, CH5200, CH2200 and Econochar). Out of four models only two models were found to be implemented (Econochar and CH2200). CME shall clarify if model CH5200 or CH5300 had low distribution or no distribution and whether any emission reductions is claimed from any of these two models.	
<b>Project participant response</b>	<b>Date: 06/07/2020</b>
All the four charcoal ICS models (CH5300, CH5200, CH2200 and Econochar) enlisted in section C.1 of the MR (Version 1.0, dated: 15/06/2020) have been distributed in the CPAs. CH5200 and CH5300 had very low distribution till the end of the monitoring period, hence the CME decided not to claim emission reductions for these two stove models during this monitoring period due to monitoring cost optimization	
<b>Documentation provided by project participant</b>	
PoA 5342 MP#7 Ghana MR1 MR v2.0 06072020	
<b>DOE assessment</b>	<b>Date: 20/07/2020</b>
The installation of ICS model (CH5300, CH5200) types was found to be small. So, the CME has chosen not to monitor or claim for it under current verification. The extra cost involved in monitoring extra samples for such a small number of distributions was the reason behind not doing it. The reason and approach were found to be reasonable. CL#01 is open in view of TR comment:	
<ol style="list-style-type: none"> <li>1. The ICS models CH5200 and CH5300 have not been considered as part of the population for conducting the sampling. CME shall explain how it this does not qualify as temporary deviation from registered monitoring plan as per para 228 of PS for PoA version 2.0.</li> <li>2. Section A.3 of the registered CPA-DDs for CPAs (5342-P1-0013-CP1 to 5342-P1-0015-CP1) does not list the CH2200 stove model (Open)</li> </ol>	
<b>Project participant response</b>	<b>Date: 14/08/2020</b>
<ol style="list-style-type: none"> <li>1. Please refer revised MR. A temporary deviation has been sought.</li> <li>2. Please refer footnote 7 of the CPA-DDs (5342-P1-0013-CP1 to 5342-P1-0015-CP1). The footnote clearly mentions that other stove models may be added to the CPA over its crediting period provided the added models meet the methodology requirements / inclusion eligibility criteria requirements.</li> </ol>	
<b>Documentation provided by project participant</b>	
Monitoring Report version 4.0 dated 14/08/2020	
<b>DOE assessment</b>	<b>Date: 17/08/2020</b>
<ol style="list-style-type: none"> <li>1. The CME has not considered the stove models CH5200 and CH5300 for the monitoring and no ERs have been claimed for these models as verified from the ER calculation sheet (Version 3.0). The model number CH5200 and CH5300 were also not found to be listed in the ICS database shared by the CME. However, no objective evidence has been provided for ensuring that the model number CH5200 and CH5300 has been implemented in small numbers with respect to footnote 1 of the MR (version 4.0). (Open)</li> <li>2. The CPA-DDs of the CPA 5342-P1-0013-CP1 to 5342-P1-0015-CP1 were reviewed and it was confirmed from the footnote 7 that other stoves models which meets both the methodological requirements/ inclusion eligibility criteria requirement for the inclusion of CPA can be subsequently added to the CPA over the crediting period of the CPA . Thus, listing of stove model CH2200 which meets both the methodological requirements/ inclusion eligibility criteria requirement for the inclusion of CPA was found to be acceptable.</li> </ol>	
<b>Project participant response</b>	<b>Date: 21/08/2020</b>
<ol style="list-style-type: none"> <li>1. The CH5200/CH5300 database is being submitted.</li> </ol>	
<b>Documentation provided by project participant</b>	
Monitoring Report version 4.1 dated 20/08/2020 ICS Distribution database (CH5200/CH5300)	
<b>DOE assessment</b>	<b>Date: 25/08/2020</b>
<ol style="list-style-type: none"> <li>1. The ICS database shared by CME for model no.CH5200 and CH5300 were checked and it was confirmed that both the models were implemented in small numbers but CME has not included these stoves in any of the monitoring exercise, sampling and Emission reduction calculations. Thus, the temporary deviation in this regard was considered and was found to be acceptable.</li> </ol>	
Thus, CL#01 stands closed.	



<b>CL ID</b>	02	<b>Section no.</b>	E.3.4.2, E.3.4.3	<b>Date :</b> 14/08/2020
<b>Description of CL</b>				
<ol style="list-style-type: none"> <li>During the current verification it was observed that there is reduction in the number of Econochar stoves (1,858) under CPA 5342-P1-0014-CP1 when compared to the previous verification (1,863). PP is requested to clarify the reason for the reduction in the number of Econochar stoves under CPA 5342-P1-0014-CP1.</li> <li>In-line to para 32 of the applied methodology AMS-II.G Version 3.0, CME shall clarify how the vintage of the deployed stoves were considered for calculating the efficiency of the stoves.(Open)</li> </ol>				
<b>Project participant response</b>				Date: 14/08/2020
<ol style="list-style-type: none"> <li>There is a typographical error in the MR which has been corrected.</li> <li>AMS II.G. version 3.0 does not have para 32. Besides, vintage wise monitoring is not required as per AMS II.G. version 3.0. Lastly, simple random sampling with ensure that samples are picked from various vintages automatically.</li> </ol>				
<b>Documentation provided by project participant</b>				
PoA 5342 MP#7 Ghana MR1 MR v4.0 14082020				
PoA 5342 MP#7 Ghana ER Sheet v3.0 14082020				
<b>DOE assessment</b>				Date: 17/08/2020
<ol style="list-style-type: none"> <li>CME has now rectified the typographical errors in the number of ICS disseminated under each CPAs as verified from the revised MR (Version 4.0) and ER sheet (Version 3.0)</li> <li>As per the applied methodology AMS-II.G Version 3.0, there is no requirement of considering the vintage of the stoves while calculating the efficiency of the stove. Also, simple random sampling has been applied by the CME for calculating the sample size which ensures that samples from all the vintages gets selected for monitoring. However, page number 59 of the registered PoA-DD mentions that ICS of different vintages will be considered while calculating the efficiency of the ICS. (Open)</li> </ol>				
Thus, CL#02 stands closed.				
<b>Project participant response</b>				Date: 21/08/2020
Page 59 of the PoA-DD mentions that ICS will include different vintages not only for efficiency but for all the monitoring parameters. This has been mentioned that the sampling frame will include stoves of different vintages (to indicate that sales are progressive). The PoA-DD nowhere mandates monitoring of thermal efficiency or for that matter, other parameters by vintage.				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				Date: 25/08/2020
<p>Page 59 does not prescribe vintage wise sampling for any particular parameter. It just mentions that different vintages will be included under monitoring for all the parameter which has already been ensured by drawing the samples randomly from the entire population hence giving equal chance to each disseminated stove/vintage to get selected.</p> <p>Additionally, vintage consideration for determining thermal efficiency was firstly introduced as a concept in AMS II.G. version 5.0 (batch wise monitoring) while the PoA 5342 is registered under version 3.0 of the methodology, which does not stipulates/mandates vintage-wise or batchwise sampling/monitoring. Thus, the approach followed by CME was found to be in line with the PoA DD and applied methodology.</p> <p>Finding opened:</p> <p>“The PoA-DD (page 59) states that the parameter sampling frame will include ICS of different vintages (i.e. year of distribution). It is observed that</p> <ol style="list-style-type: none"> <li>the stoves were distributed between 2018 and 2020;</li> <li>the Tab “WBT summary” has listed the stoves sampled for the sample monitoring of the thermal efficiency and other parameters; and</li> <li>the CPA distribution database spreadsheet provides details on which stoves have been sampled.</li> </ol> <p>The CME is requested to provide a further information on how it has implemented the monitoring of efficiency of cookstove considering the PoA-DD since both WBT summary spreadsheet and CPA</p>				

distribution database spreadsheet indicate that the vintage of 2018 was not included in the monitoring of efficiency of stoves.”

CME response

Date: 20/11/2020

Firstly, page 59 of the PoA-DD no-where mentions / requires that “parameter sampling frame will include ICS of different vintages”. The exact text mentioned on page 59 for parameters (SOF,  $f_{old}$ ,  $\mu_{old}$ , and  $\eta_{new}$ ) is as follows:

*“First monitoring will occur within 24 months of ICS distribution at the latest, and will include ICS of different vintages”*

Please note the following in this regard:

1. The header of this column in the table, where aforesaid text is specified, is “Timing” and not sampling frame. Thus, this requirement is deemed related only to the first monitoring which is far over.
2. The concerned monitoring is the 7<sup>th</sup> monitoring period under the PoA and 2<sup>nd</sup> for the CPAs covered in the monitoring report.
3. The header clearly mentions this to be “indicative” and hence is deemed non-binding.
4. The text mentions “ICS of different vintages” to be part of monitoring samples, but does not mandates “all vintages” to be part of monitoring samples.

Thus, there is no requirement in the PoA-DD, for monitoring samples listed under “WBT Summary” or “Monitoring Survey Summary” to have stoves from each vintage.

Lastly, the ICS (improved cook stoves) distributed under the CPAs covered in the MR are as follows:

ICS Model Type	2018	2019	2020	Total
CH2200	0	106	3754	3860
Econochar / SmartSaver Charcoal	28	4703	36	4767
Econofire / SmartSaver Wood	0	2594	543	3137
Total	28	7403	4333	11764

A detailed database including each of these 11,764 ICS with their end-user details and their unique serial number was submitted to the verification team and has been reviewed by the verification team as listed in the FVR, Appendix 3, item 5 and 40.

For the purpose of sample selection, the aforesaid population was categorized under two sampling frames, i.e. charcoal ICS (CH2200 and Econochar) and woodfuel ICS (Econofire) as justified in the MR page 15. Thus, the sampling frame for Charcoal ICS included 8627 units (= 3860 CH220 units and 4767 Econochar units covering 2018, 2019 and 2020 vintages) and that for woodfuel ICS included 3137 units (= 3137 Econofire units covering 2019 and 2020 vintages).

Subsequently requisite random numbers were generated using online using stattrek random number generator (<https://stattrek.com/statistics/random-number-generator.aspx>), evidence of which have been reviewed by the verification team as listed in the FVR, Appendix 3, item 37, as follows:

1. 100 random numbers from a range of 1 to 8627 were selected from charcoal ICS sampling frame
2. 60 random numbers from a range of 1 to 3137 were selected for woodfuel ICS sampling frame

Thus, each ICS unit in the given sampling frames had an equal chance of being selected for monitoring.

However given the % share of 2018 ICS in the total charcoal ICS population (sampling frame) is ~0.32%, hence only 2019 and 2020 ICS samples cropped up in the randomly selected ICS for sampling, using the online random number generator. This is completely outside the control of CME given the sampling was purely random as well as confirms representativeness of sampling population.

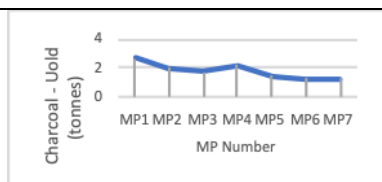
80 of the 100 randomly selected charcoal ICS samples and 47 of the 60 randomly selected woodfuel samples were monitored for SOF,  $f_{old}$  and  $\mu_{old}$  due to some samples being non-responsive or not willing to participate in monitoring surveys. A subset of selected survey samples, found operational during monitoring, were monitored for WBT hence, no 2018 samples could be monitored for WBTs.

Finally, there is no requirement in the methodology to monitor stoves of all vintages, neither in the registered PoA-DD or the CPA-DDs covered in the monitoring report.

Documentation provided by the CME

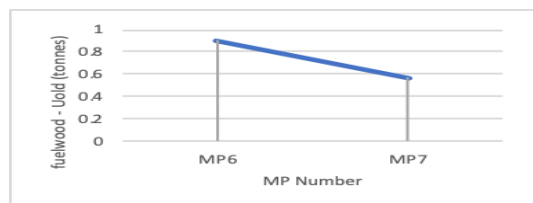
DOE assessment	Date: 23/11/2020
<p>The applied methodology AMS-II.G. version 3.0, does not refer to the term 'vintage' or 'batch' and hence there is no methodological requirement that ICS of 2018 must be covered under WBTs conducted by CME.</p> <p>The PoA DD, page 59 quotes:  <i>"First monitoring will occur within 24 months of ICS distribution at the latest and will include ICS of different vintages"</i>.</p> <p>This text is clearly mentioned as "indicative" in the PoA-DD and hence is deemed non-binding on CME by the verification team and it was prescribed for the first monitoring.</p> <p>The CME has conducted simple random sampling considering all the ICSs vintages listed within PoA population. The sampling frames were formed based on the criteria defined on page 57 of the PoA DD and as clarified in the MR, page 15. All the ICS units under a given sampling frame had an equal chance of being picked up for monitoring with ICS of different vintages (2018, 2019 and 2020) being included in the sampling frame, thus the registered sampling plan has been followed.</p> <p>The CME had shared the screenshot of online random number generator, with the referred number of samples being selected for different sampling frames. The random number selection range covered the entire population with a given sampling frame, including 2018 stoves. The screenshots confirm the statement stated above by the CME.</p> <p>Further, as reviewed by the verification team, the share of 2018 stoves in the sampling frame is very small. Thus, it is viable that 2018 stoves were not selected for monitoring using simple random sampling approach. 10 independent sets of 100 random numbers each, were also drawn out by the verification team using random.org, as a cross check and only 1 set of them resulted in a single unit of 2018 stove getting picked up for monitoring. Thus, the sampling conducted by CME is deemed representative, unbiased, credible and free of any material errors.</p> <p>The later versions of the applied methodology do require batch wise monitoring to ensure ICS of all vintages are covered under monitoring. However, that is not deemed applicable to the PoA unless the PoA period is renewed. In that case too, the vintage wise monitoring shall only be applicable to CPAs included in the PoA under PoA period 2 and not to the CPAs covered under the concerned monitoring report. Besides, the project standard, at any point, does not allow the CME to apply conditions of subsequent version of the methodology without upgradation of the PoA to the corresponding methodology version via a PRC.</p> <p>Thus, the sampling and monitoring approach followed by the CME is found to be in compliance with the registered PoA-DD and monitoring methodology and hence was accepted by the verification team.</p> <p>Thus, CL#02 is closed.</p>	

CL ID	03	Section no.	E.3.4.2	Date : 14/08/2020
<b>Description of CL</b>				
<p>Monitored value for the parameter <math>\mu_{oldcharcoal}</math> during the current monitoring period was found to be similar to the monitored value of the parameter during the previous verification. CME shall clarify how the monitoring results during the current monitoring period reveals a similar value for the parameter.</p> <p>Similarly, for parameter <math>\mu_{oldwood}</math>, the value has substantially reduced over the previous survey. CME shall explain</p>				
<b>Project participant response</b>				<b>Date: 21/08/2020</b>
<p>The similar value of the parameter <math>\mu_{oldcharcoal}</math> wrt to previous monitoring period is a mere co-incidence as this is based on the randomly monitored samples' monitoring results. Besides, the samples in the two monitoring period were mutually exclusive with no common samples. Also, the verification team had surveyed 3 out of the 8 <math>\mu_{oldcharcoal}</math> CME's sampled end-users during the RSV and no discrepancies were observed.</p> <p>The following is trend of <math>\mu_{oldcharcoal}</math> across the 7 verifications (including the current) for Ghana under the PoA is as follows:</p>				



As it can be seen there is no time-based pattern that can be established for  $\mu_{oldcharcoal}$  and the value can sway either side of the previous MP value.

For fuelwood, the trend of  $\mu_{oldwood}$  can only be established via the last two verifications, as first 5 verification did not have any fuelwood stoves.



A two-point graph is not deemed appropriate for any trend assessment; however, it can be seen that it is reducing similar to that seen in case of charcoal stoves. Thus, a reduction in  $\mu_{oldwood}$  compared to previous monitoring period is not deemed unusual.

#### Documentation provided by project participant

#### DOE assessment

Date: 24/08/2020

The parameter  $\mu_{old}$  is amount of woody biomass consumption that is consumed through the continued use of old stoves. The use of old traditional stove after receiving the new project stove may increase or decrease over time. It does not follow any pattern. Once users adapt to new project stove, baseline stove usage may reduce over time. No particular time trend on this parameter can be established in case of progressive sales projects, which have a mix of experienced users (projects stoves sold in previous years) and fresh / first time users (projects stoves sold in current year).

The graphs of previous verifications presented by the CME also demonstrates the same and a reduction in  $\mu_{oldwood}$  from last MP is deemed ok.

The value of parameter  $\mu_{oldcharcoal}$  in the current monitoring came out to be exactly same as the previous monitoring period.

The reason of getting same value is mainly because a very small number of households have been monitored 8 (meeting the requirement of minimum 7) for determining  $\mu_{oldcharcoal}$ . This is because only 8 households reported to be using the traditional baseline stove along-with the project stove out of total charcoal stove samples monitored by CME. These samples reported cooking 3 meals in a day except one that reported cooking 4 meals daily. Based on the VVB Team experience and profession judgement this is deemed usual behaviour. Besides, all these houses reported cooking one meal on the baseline stove daily. Again, this is also found an expected user behaviour and deemed correctly reported given users prefer cooking on project stoves due to associated benefits and use traditional stoves scarcely for cooking a particular meal type or cooking at a particular time. A significantly suppressed use of baseline stove after procuring project stove is expected because of significant fuel cost savings / time savings associated with cooking on project stoves. Thus, similar responses (albeit from different samples) obtained in the last verification are deemed a practical possibility by the VVB Team.

It has been checked and confirmed that completely different households were monitored and verified last time. During the current verification, a fresh sampling has been conducted for monitoring and samples are mutually exclusive of last MP samples. The monitoring survey forms have been presented for all the sampled stoves to show transparently each and every entry made in the ER sheet. Additionally, the verification team during the RSV surveyed 3 of the 8  $\mu_{oldcharcoal}$  CME's sampled end-users and no discrepancies were observed.

The chances of getting exactly same value is improbable but not impossible. Thus, after reviewing the monitoring forms and interviewing selected ICS end users, the verification team confirms that the value of parameter has been determined correctly and in line with the applied methodology and registered monitoring plan. The calculation have also been checked to confirm that the value have been calculated correctly.

Thus, CL#03 stands closed

**Table 3. CARs from this verification**

<b>CAR ID</b>	01	<b>Section no.</b>	E.3.6.4	<b>Date :</b> 26/06/2020
<b>Description of CAR</b>				
ERs achieved mentioned in MR (version 1.0, Dated:16/05/2020), was found to be inconsistent with the ERs mentioned in the ER sheet (Tab: ER calculation, Row: A43)				
<b>Project participant response</b>				<b>Date:</b> 06/07/2020
The ERs achieved have been corrected throughout the MR and now consistent with the ERs mentioned in the submitted ER sheet (Tab: ER calculation, Row: A43). The revised MR and ER Sheet are being submitted.				
<b>Documentation provided by project participant</b>				
PoA 5342 MP#7 Ghana MR1 MR v2.0 06072020 PoA 5342 MP7 Ghana ER Sheet v2.1 06072020				
<b>DOE assessment</b>				<b>Date:</b> 20/07/2020
CME has consistently mentioned the ERs Achieved throughout the revised MR (Version 2.0, Dated: 20/07/2020). The ERs achieved mentioned in the MR was found to be consistent with the ERs achieved mentioned in the ER sheet (Version 2.1)				
Thus, CAR#01 was closed.				

<b>CAR ID</b>	02	<b>Section no.</b>	E.3.4.2	<b>Date :</b> 25/06/2020
<b>Description of CAR</b>				
<ol style="list-style-type: none"> <li>1. For parameter <math>N_{all}</math>, under section E.2., the number of project stoves mentioned is inconsistent with the project stove mentioned in the ER sheet (Tab: ER calculation, Row:A28 and A29)</li> <li>2. Value of <math>\mu_{old}</math> is inconsistent with the value mentioned in the ER sheet (Tab: ER calculations, Cell: A23 and A24).</li> <li>3. For many parameters like <math>Stove_{year}</math>, <math>\eta_{new,y}</math>, <math>f_{old}</math>, SOF The ER sheet applied separate values of charcoal/wood. However, in the MR sheet an average value is presented. CME shall clarify.</li> <li>4. The calibration details for the monitoring equipment used for WBT could not be found under section E.2 of MR (*Version 1.0, Dated:15/06/2020).</li> </ol>				
<b>Project participant response</b>				<b>Date:</b> 06/07/2020
<ol style="list-style-type: none"> <li>1. The number of project stoves installed/distributed i.e. parameter <math>N_{all}</math> has been corrected in MR and now consistent with the information in the submitted ER sheet (Tab: ER calculation, Row:A28 and A29).</li> <li>2. The value of <math>\mu_{old}</math> has been corrected in the MR and now consistent with the value mentioned in the submitted ER sheet (Tab: ER calculations, Cell: A23 and A24).</li> <li>3. For monitoring parameters like <math>Stove_{year}</math>, <math>\eta_{new,y}</math>, <math>f_{old}</math>, SOF separate values for charcoal and wood stoves have now been mentioned in the revised MR.</li> <li>4. The equipment used for the WBT are newly purchased and hence measurements are deemed done with necessary guarantees. The details of monitoring equipment used for WBTs has been added in section E.2 of the revised MR.</li> </ol>				
The revised MR is being submitted.				
<b>Documentation provided by project participant</b>				
PoA 5342 MP#7 Ghana MR1 MR v2.0 06072020				
<b>DOE assessment</b>				<b>Date:</b> 20/07/2020

1. CME has now corrected the number of project stoves installed/distributed as mentioned in the MR (Version 2.0) with the number of project stoves mentioned in the ER sheet (Version 2.1).
2. Value of parameter  $\mu_{old}$  mentioned in the revised MR (Version 2.0) was found to be consistent with the value mentioned in the ER sheet (Version 2.1)
3. CME has now mentioned the separate values for charcoal and wood stoves for the monitoring parameters like  $\text{Stove}_{year}$ ,  $\eta_{new,y}$ ,  $f_{old}$ , SOF in the revised MR (Version 2.0)
4. CME has now mentioned the details regarding the WBT equipment used for WBT under section E.2 of the revised MR (Version 2.0). The details were cross-checked from the evidences shared by the CME. Thus, was found to be acceptable.

Thus, CAR#02 was closed.

<b>CAR ID</b>	03	<b>Section no.</b>	E.2.1.	<b>Date :</b> 20/07/2020
<b>Description of CAR</b>				
Section C.1 of the MR mentions that only one ICS unit is given to a household and no HH in the CPA-database owns more than one ICS unit. However, as per the CPA distribution database it was observed that few of the HHs owned more than one ICS unit (e.g. Millicent Azorlibu, Cell: G7300 & G7301, Worksheet: Charcoal). CME shall explain how double counting has been avoided. (Open)				
<b>Project participant response</b>				<b>Date:</b> 29/07/2020
The ICS distribution in the CPAs covered in the monitoring report is fully sponsored by CERPD. Given, only one ICS can be credited per household hence it is ensured that any HH possess only one unit of project ICS and there are no users with multiple ICS units. For this purpose, at the time of distribution a potential beneficiary has to confirm that they are not having any other Envirofit ICS. The beneficiary receives a project ICS only if it is singular Envirofit ICS for the beneficiary. This information is captured in the end user agreement / CPA distribution record which is used to prepare the CPA distribution database.				
Secondly, the CPA distribution database is checked for duplicate serial numbers or multiple stoves per household and any such cases are removed from the CPA Distribution Database. The case referred in the CAR above reflects two different beneficiaries with same name but different addresses. Hence, there is no double counting in this case. Additionally, if one checks the name, address, and phone number combination (deemed unique for a given beneficiary) in the CPA Distribution database, no two project ICS are found stacked confirming no double counting of emission reductions.				
Lastly, at the time of ex-post sample-based monitoring, the presence of multiple project ICS in a given household is also confirmed. In case samples report more than 1 ICS unit in the household, the ICS population is mandated to be discounted accordingly as per the registered monitoring plan. In the current monitoring, no sample has reported using more than one project ICS hence any discount to ICS population is not necessitated.				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 31/07/2020
The CPA-distribution database shared by CME was reviewed to confirm if there is any beneficiary with multiple ICS. It was found that no beneficiary has more than one ICS unit at the same address/location. Thus, no discount was applied to the ICS population in-line to the registered monitoring plan which was found to be acceptable.				
Thus, CAR#03 stands closed.				

**Table 4. FARs from this verification**

<b>FAR ID</b>	xx	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
No FAR from this verification				
<b>CME response</b>				<b>Date:</b> DD/MM/YYYY
XX				
<b>Documentation provided by the CME</b>				
XX				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
XX				

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"><li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN);</li><li>• Make structural and editorial improvements.</li></ul>
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		